

WHAT IS CLAIMED IS:

1. A method for establishing a wireless data connection between wireless communication devices in an ad hoc wireless mesh network, comprising:
 - sending from a first wireless communication device a channel clearance assessment message over a first channel in an ad hoc wireless mesh network;
 - determining that the first channel is not available;
 - sending a channel clearance assessment message over a second channel in the ad hoc wireless mesh network;
 - determining that the channel is available; and
 - sending a data communication to a second wireless communication device over the second channel in the ad hoc wireless mesh network.
2. The method of claim 1, wherein the sending data communications step further comprises:
 - sending from the first wireless communication device a request to send message over a control channel to the second wireless communication device, the request to send message comprising a communication channel identifier representing the second channel;
 - receiving at the second wireless communication device the request to send message;
 - parsing the request to send message to determine the communication channel;
 - sending a clear to send message over the control channel in response to the request to send message; and
 - receiving at the second wireless communication device a data communication from the first wireless communication device on the second communication channel.

3. A method for increasing throughput in an ad hoc wireless mesh network having a plurality of wireless communication devices, comprising:
 - sending a clear channel assessment message on a first channel in an ad hoc wireless mesh network;
 - determining that the first channel is busy;
 - sending a clear channel assessment message on a second channel in the ad hoc wireless mesh network;
 - determining that the second channel is available; and
 - sending a data communication frame on the second channel.
4. The method of claim 3, wherein the data communication frame is one frame of an internet protocol datagram comprising a plurality of frames.
5. The method of claim 3, further comprising executing a high bandwidth application over the wireless mesh network.
6. The method of claim 3, further comprising executing a high bandwidth protocol over the wireless mesh network.
7. The method of claim 6, wherein the high bandwidth application is for security.
8. The method of claim 6, wherein the high bandwidth application is for building automation.
9. The method of claim 6, wherein the high bandwidth application is for energy management.
10. The method of claim 6, wherein the high bandwidth application is for supply chain management.
11. The method of claim 6, wherein the high bandwidth application is for logistics.

12. The method of claim 6, wherein the high bandwidth application is for sensor data.
13. The method of claim 6, wherein the high bandwidth application is a data streaming application.
14. The method of claim 13, wherein the data streaming application comprises streaming video.
15. The method of claim 13, wherein the data streaming application comprises streaming audio.
16. The method of claim 15, wherein the data streaming application comprises voice data.
17. The method of claim 6, wherein the high bandwidth application is a multi-player gaming application.
18. The method of claim 17, wherein the multi-player gaming application comprises real-time voice data.
19. The method of claim 5, wherein the high bandwidth application is a voice call.

20. A method for increasing data communication throughput in an ad hoc wireless mesh network having a plurality of wireless communication devices, comprising:
- sending from a first wireless communication device a request to send message at a first power level, wherein the first power level is optimized such that the substantially maximum range of the request to send message will reach a predetermined second wireless communication device;
 - receiving at a second wireless communication device the request to send message;
 - sending from the second wireless communication device a clear to send message in response to the request to send message, wherein the clear to send message is sent at a second power level and the second power level is optimized such that the substantially maximum range of the clear to send message will reach the first wireless communication device; and
 - wherein the clear to send message identifies the first wireless communication device as being able to send data communications to the second wireless communication device.
21. An improved wireless communication device, comprising:
- a wireless network interface configured to allow a wireless communication device to send and receive data communications over a wireless communication network;
 - a communication protocol stack including a media access control layer, wherein the media access control layer is adaptable to send a data communication comprising a plurality of frames, wherein a first frame is sent on a first channel in the wireless communication network and a second frame is sent on a second channel in the wireless communication network.

22. The improved wireless communication device of claim 21, wherein the media access control layer is further adaptable to send a plurality of individual frames of a data communication over a plurality of discrete channels in the wireless communication network.
23. The improved wireless communication device of claim 21, wherein the media access control layer is further adaptable to identify an available channel in the wireless communication prior to sending a frame with a size greater than a predetermined threshold.
24. The improved wireless communication device of claim 21, wherein the predetermined threshold is two kilobytes.
25. A method for conserving battery power in a wireless communication device, comprising:
 - determining the distance to a recipient wireless communication device in a wireless communication network;
 - identifying a minimum power level needed for a request to send message to reach the recipient wireless communication device; and
 - maintaining a routing table associating the recipient wireless communication device and the identified minimum power level needed for a request to send message to reach the recipient wireless communication device.
26. The method of claim 25, further comprising sending all request to send messages to the recipient wireless communication device at the minimum power level.